قياس أثر برنامج التدخل السلوكى على خفض سلوك عدم الامتثال لطفل واحد تصميم دراسة الفرد الواحد

Measuring the effect of a behavioral intervention program to Decrease Non-compliance Single Subject Research Design

إعداد

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كلية التربية – جامعة الجوف

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المستخلص:

أجريت هذه الدراسة على طالب واحد ملتحق بنظام المدارس الحكومية في مدينة الرياض، وهدفت إلى قياس أثر برنامج التدخل السلوكي على حالة واحدة لطفل يبلغ من العمر ستة أعوام لديه سلوك عدم الامتثال. وتم استخدام برنامج التدخل السلوكي: الذي يضم مجموعة من الاستراتيجيات التي احتوت على التحفيز الإيجابي والتعزيز التفاضلي الإيجابي واستخدام استراتيجية تسلسل الأوامر—عالية الاحتمال لزيادة تحفيز حدوث سلوك الامتثال وخفض تكرار حدوث سلوك عدم الامتثال لدى الحالة تحت الدراسة. استخدمت الدراسة أسلوب دراسة الفرد الواحد من خلال استخدام التصميم التجريبي (أ ب) حيث ثم تحديد خط أساس (أ) ومن ثم تقديم برنامج الزخم السلوكي كتدخل علاجي لمرة واحدة (ب) وبالتالي قياس الأثر والتغير الذي حدث عند مقارنة قيم تكرار حدوث سلوك الامتثال وعدم الامتثال في كلا المرحلتين. استخدمت الدراسة رصد وتسجيل حدوث تكرار سلوك الامتثال بشكل إجرائي لمدة ١٥ يوماُ. شملت

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متغيرات الدراسة برنامج التدخل كمتغير مستقل وسلوك الامتثال من عدمه كمتغير تابع. أظهرت النتائج تغيّر إيجابي أشار إلى حدوث سلوك الامتثال ودلالياً تناقص سلوك عدم الامتثال. أشارت نتيجة هذه الدراسة إلى تأثير إيجابي أحدث زيادة تكرار سلوك الامتثال؛ من ٠٪ في حالة خط الأساس إلى ٤٠٪ في اليوم الأول من مرحلة التدخل حتى وصلت إلى ٧٥ و ١٠٠٪ في الأيام الأخيرة من مرحلة التدخل. أيضاً، أثناء قياس تسارع اتجاه التأثير الناتج لبرنامج التدخل على السلوك، ومن خلال قراءة الدلالات على الرسم البياني، أظهر ذلك زيادة في القيم المنسقة بمجرد مرور الوقت خلال مرحلة التدخل. أيضا، أظهرت النتائج أن ٨٥٪ من نقاط البيانات وقعت على ٢٠٪ من القيمة المتوسطة (٦٤)، والتي أشارت بالتالي إلى ضمان استقرار الاتجاه. سجل التغير نسبة متكاملة شملت حدوث سلوك الامتثال بنسبة ١٠٠٪ في نهاية تقديم برنامج التدخل مقارنةً بقيم تكرار السلوك خلال مرحلة خط أساس التجربة. كل ذلك يقترح فعالية برنامج الزخم السلوكي كبرنامج تدخل يضم مجموعة من الاستراتيجيات كالتحفيز الإيجابي والتعزيز التفاضلي الإيجابي واستخدام استراتيجية تسلسل الأوامر-عالية الاحتمال-لزيادة فرصة تكرار حدوث سلوك الامتثال لدى من لا يظهر هذا السلوك من الطلاب. نتائج هذه الدراسة تدعم قاعدة البحوث السابقة التي أوصت سابقاً بضرورة استخدام مثل هذه برامج السلوكية لتقليل حدوث سلوك عدم الامتثال. وقد تم في ضوء نتائج الدراسة تضمين بعض قيود الدراسة التي واجهها الباحث.

الكلمات المفتاحية: دراسة الفرد الواحد، سلوك عدم الامتثال، برنامج التـدخل، الزخم السلوكي، التغير.

Measuring the effect of a behavioral intervention program to Decrease Non-compliance Single Subject Research Design

Abstract

This study was performed with one male student enrolled in a public-school system in Riyadh City. The study was a single subject, AB design study. The independent variable was an intervention that included a positive differential reinforcement and the use of one high-probability command sequence strategy based intervention for two hours' sessions for 15 consecutive days. The dependent variable that was measured is noncompliance. This variable was defined as the student not following directions or direct requests within five seconds. When the student was asked to do his homework, or leave things, he argued with his parents or waits more than five seconds to follow directions.

The intervention consisted of high-probability command sequence, and differential reinforcement of behavior intervention. The result of this study indicates a very positive effect on increasing the complaint behavior; increased from 0% in the baseline condition to 40 % in the first day of the intervention until it reached 75 and 100% in the last days of

the intervention. The trend direction accelerated which suggested an increasing in ordinate values over time. Also, 85% of the data points fall on 20% of median value (64), and that ensured the trend stability.

The results of this study indicate that some students will benefit from the high-probability command sequence strategy based intervention and positive differential reinforcement. Further, the finding of this study supports the research-base that recommends using such strategies to decrease noncompliant behavior Limitations are also discussed.

Introduction

Noncompliance is described as failure to follow instructions and directions delivered by parents and caregivers (Wilder et al., 2012; Forhand, Gardner, & Roberts, 1978). Noncompliance behavior is one of the most common problem that young children may exhibit (Crowther, Bond, & Rolf, 1981; Rodriguez, Thompson, & Baynham, 2010). Further, noncompliance was found to be associated with other serious behavior such as conduct disorder (Keenan & Wakschlag, 2000). In addition, parents and teachers face this problem across the home and school settings. Noncompliant behavior can be performed to get attention from others, to escape and avoid demands, or both. Younger children might exhibit this behavior with instructions specially, they are asked to stop

their preferred activity or start a no preferred activity (Wilder et al., 2012).

There were various research base interventions used for increasing the compliant behavior. These For instance, include no contingent access to preferred items interventions, and advance notices of an upcoming transition technique as well as the high-probability command sequences, which is an antecedent base intervention for noncompliance (Wilder et al., 2012). Among all those interventions, High-probability command sequences intervention is the most studied and used with non-compliance behavior since few decades (Mace et al., 1988). A large proportion of studies used this intervention, and showed that it is effective at decreasing non-compliance (Wilder et al., 2012). Further, Houlihan, Jacobson, and Brandon, (1994) claimed that such intervention was found to be effective with young children disabilities who exhibit non-compliance (as cited in Wilder et al., 2012).

Statements of problem

Compliant behavior is crucial for students to learn, many evidence-based research studies have explored strategies and methods to reduce non-complaint behavior. Research has shown that there are many effective tools, strategies, and techniques that reduce non-compliant behavior. Many studies have use mixed methods while others have used an individual strategy to reduce non-compliance. The following instructions

that teachers implement are very important to enhance class-wide and individual student performance (Austin and Agar, 2005).

Although many studies reported that high-probability command sequences (HPCS) was very effective to decrease non-compliance behavior, other studies have found either negative or mixed results. For instance, Wilder (2012) reported that HPCS was not effective at increasing those areas of compliance and decreasing self-injury exhibited by a woman with mental retardation. Those mixed results suggest further investigation. Therefore, it is very important to examine these procedures so that effective interventions can be determined. In addition, identifying effective interventions may decrease the use of ineffective procedures.

Literature review

HPCS is suited to a wide variety of strategies at circumstances. With many of these strategies, the undesired behavior must first occur before a corrective procedure can be implemented. As a result, there are not many strategies that can rearrange the classroom environment with the goal of preventing or reducing the undesired behavior. So, the antecedent strategies are very effective to work in concert with interventions that are designed to increase classroom compliance. The antecedent approach includes rearranging the settings in order to minimize opportunities for noncompliance

(e.g., Banda et al., 2003; Kern et al., 1994; Mace et al., 1988).

Lee (2005) reported that the antecedent intervention strategies maintain several advantages over reactive strategies. Methods that prevent noncompliance may be more efficient, produce long-lasting results, and do not require the noncompliant behavior to occur before implementing the intervention (Lee, 2005). So antecedent intervention strategies can quickly and dramatically improve problem behavior by changing or removing variables in the classroom settings that cause the occurrence of the problem behavior (Kern and Clemens, 2007).

On of the effective empirically supported antecedent strategy that increase compliance is high-probability command sequences (HPCS). HPCS is designed to include a set of simple commands to which an individual is likely to comply immediately prior to the delivery of a command that has a lower probability (Low-p) of compliance. The HPCS establishes a ''momentum'' of compliance that may continue through the Low-p commands (Mace et al., 1988).

In another study, Axelrod and Zank (2012) investigated the effectiveness of HPCS on increasing compliance. Researchers used this intervention strategy in there study on two elementary students who demonstrated patterns of non-compliant behavior. The intervention was implemented by combining HPCS into ongoing classroom reading instruction

and independent seatwork. Student performance after applying this intervention was significantly higher than their performance before the intervention was implemented.

By implementing more than one strategy to reduce noncompliant behavior, a study was conducted using guided compliance and proximity praise generally practiced by teachers in the participating schools. The result of this study shows that students were reinforced for appropriate behavior following noncompliance less than one-third of the time. The result suggested that teachers are using a broad range of recommended strategies, but the results also serve as a reminder of the importance of providing positive reinforcement for appropriate behavior following an episode of noncompliance (Ritz, Noltemeyer, Davis, and Green, 2014).

In another study that used this same effective strategy, a teacher-designed and implemented a sequence of high-probability instructional commands preceding a targeted low-probability command, which was implemented as an attempt to increase compliance to the low-probability command. The finding of this study indicated that there was an increase in compliance to low- probability classroom commands for a seven year-old student with moderate mental retardation and Down Syndrome (Belfiore, Basile, and Lee, 2008).

Purpose of the study

The purpose of this study was to practice and investigate the effect of differential and positive reinforcement on reducing non-compliant behavior. In addition, this study attempts to examine the use of one high-probability command sequence strategy to decrease a pattern of non-compliant behavior. The study attempted to answer the question: Do those strategies effectively increase the compliant behavior? In other words, does positive, differential reinforcement and the use of one high-probability command sequence strategy decrease non-compliant behavior of children?

Procedures

This study was conducted on a student who exhibited non-compliant behavior. Student N demonstrates non-compliant behavior that may negatively influence the quality of his homework, on his parents' time, and his responsibilities. This study was conducted to increase his positive behavior and decrease his undesired behavior at home. As a result, the need for an intervention approach was needed in this case.

The sample

The participant, the subject of this study, N, is a six-year-old first grade student, who is enrolled in an elementary school, in public-school system in Riyadh City. The student is not prescribed medicine and does not have a disability. In

addition, he receives one-on-one assistance on reading and writing classes, as these skills are below average. His performance is average within the other subject areas. He does not have any problems with sleep patterns, and he sleeps normally. Also, his eating routine and diet seem to be regular and normal. He likes to eat organic food, chicken nuggets, pizza, fruits, and other homemade food.

This study was conducted within the student's parents' home in Riyadh City. The interview tools, baseline, and intervention were recorded at the same place. Every occurrence of the behavior was happening in the living room of his home where he typically plays. There are five people who experienced and watched this process in the same house: him, his parents, his brother who is 4 years old. The results and the analysis of this study occurred in different place, in the researcher's agency.

Study's Variables

The dependent variable that was measured is noncompliance while the independent variable was the implementation of intervention strategies. Noncompliance was defined as the student not following directions or direct requests within five seconds. When the student was asked to do his homework or leave things, he argued with his parents or waits more than five seconds to follow directions. The replacement behavior was determined as following the verbal

directions and requests within three to five seconds without refusal or arguing.

Method

The approach follows single subject design, and the AB design was chosen to conduct this study. Gast (2010) has stated that such design helps to compare the individual's behavior before and after the implementation of the intervention. Researchers choose this design because it is quick and helpful in simple settings. This design requires that the target behavior be measured repeatedly in two conditions: baseline (A) and intervention (B). The AB design helps to compare the child's behavior before and after the intervention is implemented.

Data Collection

To measure the target behavior in baseline and intervention phases, latency and event recording were used. Latency recording measures the amount of time that is after listening to the request until student begins to perform the behavior. The stopwatch was started when the antecedent was provided and stopped when the behavior occurred. The number of seconds or minutes that are between the end of the antecedent and the onset of the behavior was recorded. The target of observing the child was to determine the time he takes to initiate a response, which could be evaluated by using

latency recording. The child was observed for two hours per day for five days in the baseline condition and ten days in the intervention condition. During the observation period, the time of latency was recorded by using a stopwatch when the prompt was given and stopped when the response occurred. Also, the event recording was used to show the frequency of the target behavior. The frequency can be determined by counting the times that the student was compliant or noncompliant during the observation period.

When interviews were conducted with both parents, they indicated that this behavior is happening at home more than school. He gets annoyed and does not follow directions, especially in leisure time when he is playing.

The predictor in this case seems to be that when his parents give him his homework, he is most likely will argue or escape. His father indicates that when they praise him, he may follow directions sometimes but not all the times. The student has not been taught skills for following directions so he may need that.

The result of this Functional Assessment Interview indicates that there is a predictable factor regarding his behavior problem, which is playtime at home. The behavior occurs in the evening between 5:00 pm and 7:00 pm. It seems to be that he is annoyed of been taken out of his play activity at home. One form of his desired play time is watching movie

cartoon. He gets to pick whatever he wants to do during free time, such as playing with his brother, watching TV, or playing with his devises and computers. The student exhibits the behavior at home and outside, but not at school. He uses those opportunities to play with different tools (reinforcements). There are four people who live in the same house: him, his parents, and his brother who is 4 years old.

Non-compliant behavior is most likely to occur during his playtime. However, the behavior is least likely to happen in the morning and at school as reported by his teacher. Also, his mother reported that his non-compliance happens when is bothered with noise or his brother screaming. He has fought with him to play with his iPad. In addition, his parents have said that if the student is instructed to give back his computer or told 'no' he will most likely preform the undesirable behavior. He will be frustrated if you ask him to preform a difficult task, and he will most likely be sad if you interrupted his desired activity such as watching TV, eating a snack, or playing. The student cares a lot about changing his routine or schedule of activities at home. For example, his father indicated that he would become upset and argue about getting his stuff right away to play with.

The Functional Assessment Interview sheet also indicated that the communicative function of him rejecting a situation or activity will be moving away. Also, there are some things that

his parents indicate that should be avoided with him such as screaming, noise, and telling him no. His parents indicate that the noncompliant behavior starts to occur when he gets his new devises and computer games.

The Motivation Assessment Scale was conducted with his father and mother. The results of this MAS shows that tangibility (16 points on the tangible scale) and escape (12 on the scape scale) are what drive his undesired behavior the most.

The researcher conducted ABC analysis to understand what events are associated with the student's non-compliant behavior. ABC analysis shows that non-compliance occurs when the child is been taken from his preferred playtime. In addition, when the student starts to preform a hard task such as his homework, he most likely preforms the non-compliant behavior again. The student, as the ABC analysis indicates, likes to keep some play devises and move away (escape) when he is presented with a hard task. That demonstrates that the two functions of the behavior are the escape and the tangibility.

The results of the interview, MAS, and ABC analysis were consistent with each other. They show two functions on the same behavior, which are escape from tasks and tangibility. Non-compliant behavior occurs when the student is

playing and the reinforcers are moved from him or when he is given a hard task to preform.

Inter-observer Reliability

To ensure the Inter-observer reliability, the event data recording was used. A graduate student was trained to use the event data recording method. Both of observers were counting when the noncompliant behavior that was occurring. The formula for the reliability of event recording was determined by dividing the smaller number by the larger number of recorded occurrences. The Inter-observer reliability observation period was conducted through the baseline and intervention condition. The Inter-observer reliability through baseline reached to 90% while it reached to 95% during the intervention phase. The Inter-observer reliability in the baseline intervention conditions were acceptable.

Also, the graduate student was trained to use the latency recording to monitor noncompliant behavior as a second observer. The first and second observer recorded noncompliant behaviors for two hours of the observation period. Both were observing and recording until their level of agreement reached 95% across the baseline and intervention phases. Then, the reliability of latency data was determined by dividing the longer time by the shorter time and multiplying by 100.

Experimental Design

This design used a baseline (A) and an intervention (B). The AB design helps to compare the child's behavior before and after the intervention is implemented.

In the baseline condition (A), the child was observed for two hours in his home to measure the rates of the noncompliant behavior. There was not any intervention that was used through the baseline phase. In the intervention phase (B), the interventions were implemented for ten days. There were effective strategies that were introduced which are positive reinforcement, high-probability command sequence, and differential reinforcement of other behaviors interventions.

Intervention

The following are used for improving the student's non-compliant behaviors: The student was given choices to pick the time to work on his task and homework. Additionally, because the student is annoyed when anyone asks him to do a task while he is playing, he was given prompts after the activity' playtime and he was given opportunities for choice making throughout the day.

Antecedent Techniques. Dealing with the student's behavior requires working with some techniques that point out the events that are triggering the behavior. The first one of those techniques which was used is teaching (Prompting

Positive Behavior) the student to ask for help instead of escaping from non-preferred tasks. The High-Probability Command Sequence technique is very important to address the events with non-compliant behavior. He was given easer tasks instead of the hard ones so he can work and be on-task more.

Consequence Techniques. In this student's case, the researcher wants to increase the occurrence of following directions, which is the desired behavior, and decrease non-compliant behavior, which is the undesired behavior. There are some techniques and strategies that were applied with the student's behaviors:

First, the positive reinforcement technique was used with the activity's time at home. He was given 20 additional minutes to play with his computer games and other devises every day when he is preforming the desired behavior following instruction and direction. Every time he followed the direction and demonstrated the desired behavior resulted in an additional five minutes of playtime. That was implemented based on the implementation of the continuous schedule of reinforcement technique.

Some other techniques used to reduce the undesired behavior included Response-Cost procedure, as it is helpful to increase that pattern of behavior. So, with every time that the student in which did not listen or follow the directions that did cost him five minutes from his original playing time.

Differential Reinforcement of other behaviors also was used. The student was told if he listened and followed instruction during the day, then he can watch a movie before he went to sleep. So, when he followed directions, he was permitted to watch movies.

The behavior objectives included the following: (a) when given instructions, the student will follow the directions within 5 seconds and without arguing 2 out of 3 times, (b) when given instructions, the student will follow directions with no more than one prompts or (b) and (c) when given a task, student will ask politely for help to get clarification on 4 out of 5 occasions.
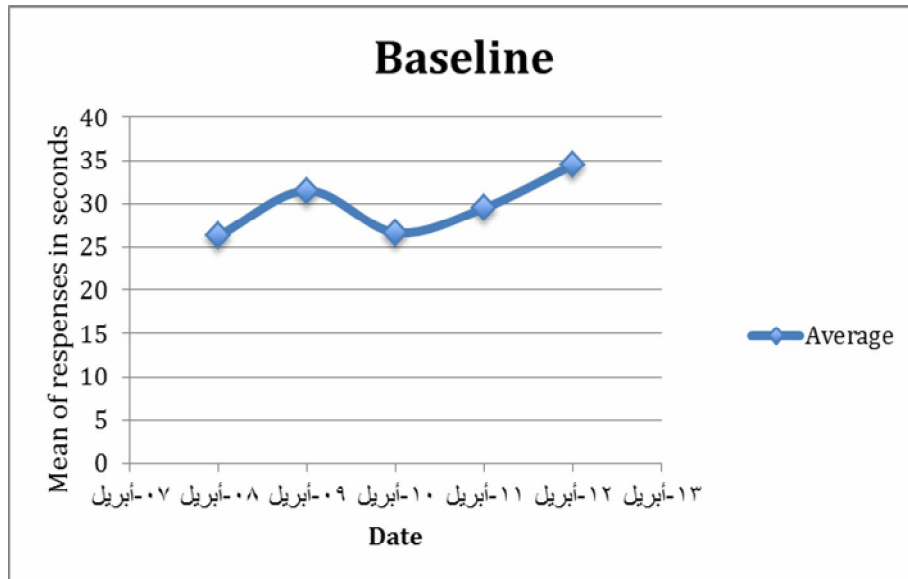
Results

Figure 1: baseline phase

The result of the baseline phase. After five days of baseline observation for two hours each day, the baselines data indicated the student took a long time to begin his tasks, which indicated a behavioral problem. As the ABC analysis indicated, there are two functions of the student's behavior. The baselines data indicated that the student preformed the behavior in order to get tangible or to escape from tasks. The behavior occurred for 15 times throughout the baseline phase. The average of all the total length of time to preform non-complaint behavior through the baseline phase was 29.67 seconds. The data showed a stable accelerating trend. The baselines data was stable.
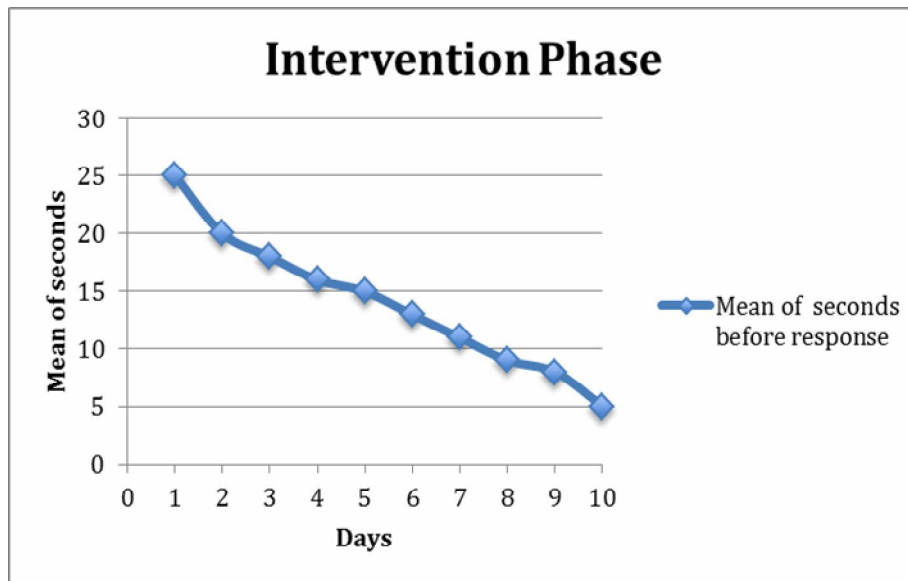

Figure 2: Intervention phase

Intervention condition. The intervention was implemented for ten consecutive days. During the intervention phase, the student was reinforced every time he listened and followed the instruction in or less than 5 seconds in the reinforcement schedule. The average of the all the time length where student was preforming the non-compliant behavior was 10 through two hours of the observation each day. The mean of the data dropped from 29.67 in the baseline to 14 in the intervention phase. The gap between the two averages of the both phases was above 14 points.

Also, based on the visual graph of the intervention above, the trend of data in the intervention phase seemed to decelerate; implying an acceptable deceleration.

This result showed that the used interventions were effective in decreasing the amount of time elapsed to initiate the behavior. In addition, the latency time decreased in all the occurrences as the target is to follow the instruction within 3 to 5 seconds. During this intervention phase, the student demonstrated the ability to follow the directions in an acceptable time in most of the responses. That data showed that using the interventions were very effective in increasing compliant behavior.
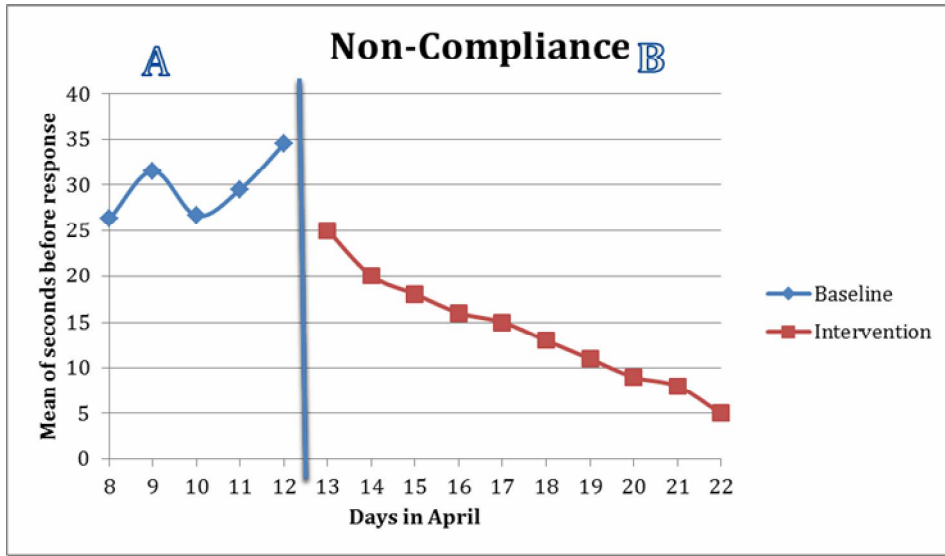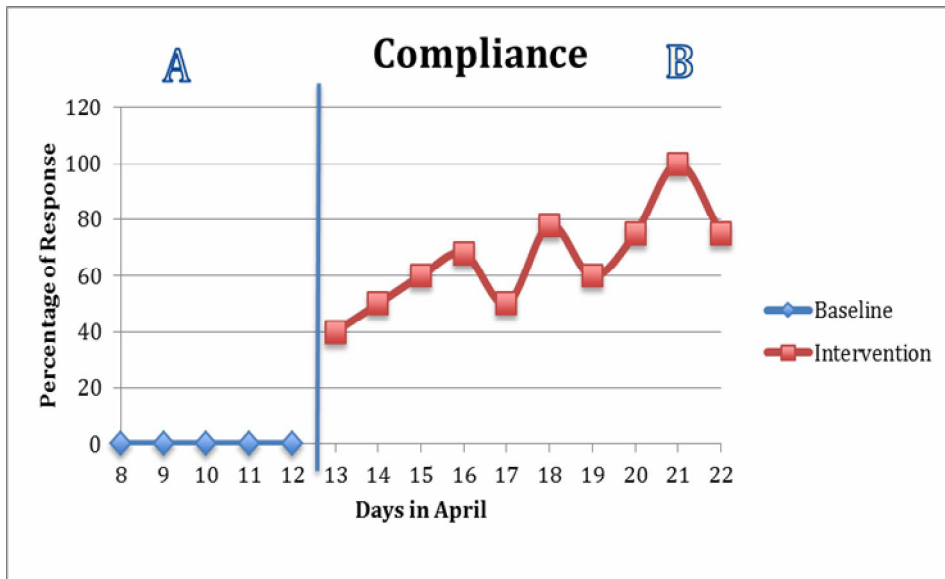
Figure 3: baseline and intervention conditions

Percentage of compliance: Figure 4: percentage of compliance.

Baseline Condition. The percentage of the compliant behavior was low though all the five days of the baseline phase. As shown, there were five data points plotted within the baseline condition, and the compliant behavior did not occur during all of those five days. Subsequently, the baselines data was stable, as the student was not preforming the compliance. The baselines data was stable. The mean was (0). There was not any level of change, as the student was not preforming the compliant behavior at all. So is the trend. During the baseline, the non-data indicated that the intervention must be implemented to increase the compliant behavior.

Intervention Condition. The intervention was implemented for ten consecutive days. As the graph shows that there are ten data points plotted within the intervention phase. The intervention average value; the mean is 50 and 65% of mean is 27.5. Then, 32-97 (65- or+ 32), there was one data point that varied more than 50% from the mean. The absolute level change within the intervention condition is 75-40= 35, which is an improved level in which the behavior was occurring more frequently. By calculating the median value, the relative level change of the intervention is computed of the first half, which is 50, and the second half is 75, Subtracting 50 from 75 is 25. The relative level change improved. The trend direction is accelerating which is increasing in ordinate values

over time. Also, 85% of the data points fall on 20% of median value (64), and that ensured the trend stability.

Discussion

During the intervention phase, the compliant behavior occurred more frequently. During the baseline, the behavior had one or no occurrence in most days of the baseline condition. The percentage of compliant behavior increased from 0% in the baseline

condition to 40 % in the first day of the intervention until it reached 75 and 100% in the last days of the intervention. It was noticed that the trend direction accelerated which suggested that ordinate values increased over time. Also, 85% of the data points fall on 20% of median value (64), and that suggested that the trend was stable.

Conclusion

It can be concluded based on the results and the graph that the intervention was a very effective intervention that increased the compliant behavior. Because the purpose of this study is to examine and investigate the positive reinforcement, high-probability command sequence, and differential reinforcement of other behaviors interventions, the finding of this study supports the research-base that recommends using such strategies to decrease noncompliant behavior. There is

enough evidence that to use those interventions results in increasing the compliant behavior from non-occurrence in the baseline phase to be 100% at the end of the intervention in this study.

The researcher of this study faced many obstacles. The time issue was one of those obstacles. Also, the strategies that were used were not easy ones to implement for parents and the child. Finally, in the behavioral field, using more than one strategy can lead to confusion sometimes during the implementation phase.

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